

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Harry Eugene Flynn, Robert O. Martin, and Charles A. Natalie
Serial No.: 10/670,981
Title: CHANGING FLUID FLOW DIRECTION
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Examiner: James M. Hewitt
Art Unit: 3679
Conf. No.: 8092
Docket No: TRX06-01(1097)

MAIL STOP APPEAL BRIEF - PATENTS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANTS' BRIEF ON APPEAL

Sir:

This Appeal Brief is filed in response to the Office Action mailed from the United States Patent and Trademark Office on June 5, 2007 ("current Office Action"). The current Office Action reopened prosecution subsequent to Appellants' filing of an Appeal Brief on January 25, 2007. Pursuant to the Supervisory Patent Examiner's ("SPE's") options provided in the current Office Action, Appellants are filing this Appeal Brief as well as a Notice of Appeal. Consistent with the SPE's options, it is Appellants' understanding that the previously paid Notice of Appeal fee and Appeal Brief fee is hereby applied to this new appeal and no new fees are necessary.

APPELLANTS' BRIEF ON APPEAL

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1. REAL PARTY IN INTEREST

The real party in interest of the above-captioned patent application is the assignee, TRONOX LLC.

2. RELATED APPEALS AND INTERFERENCES

There are no known other prior or pending appeals, interferences, or judicial proceedings which may be related to, directly affect, be directly affected by, or have a bearing on the Board's decision in the pending Appeal.

3. STATUS OF THE CLAIMS

Claims 1-11 and 15-27 have been canceled and Claims 12-14 and 28-29 stand rejected. Claims 12-14 and 28-29 are being appealed.

4. STATUS OF AMENDMENTS

In the Response filed April 28, 2006 (i.e., subsequent to final rejection), Appellants amended Claims 28-29. The Examiner entered these amendments in the Advisory Action mailed July 14, 2006. No other amendments have been made since the final rejection.

5. SUMMARY OF CLAIMED SUBJECT MATTER

12. A piping elbow, comprising:

a substantially cylindrical body (804/805) having a first end and a second end, wherein at least one of the ends is removably attached, and wherein the body contains a removable liner (808);

a tangential inlet (802) attached to the body near the first end having a diameter smaller than the diameter of the body, wherein the tangential inlet contains a removable liner (806); and

a tangential outlet (802) attached to the body near the second end having a diameter smaller than the diameter of the body, wherein the tangential outlet contains a removable liner (806).

Claim 12 is drawn to the more general embodiment of a piping elbow, comprising a substantially cylindrical body containing a removable liner, a tangential inlet containing a removable liner, and a tangential outlet containing a removable liner. Claim 12 is supported by

the specification as a whole, but especially by Figures 5-11; page 1, line 23 to page 2, line 22; page 4, lines 12-19; page 7, lines 18-21; page 9, lines 7-29; and page 12, lines 3-26.

Claim 13 depends from Claim 12 and further limits Claim 12 by requiring that “the tangential inlet liner and the tangential outlet liner are each inserted into a cavity in the body liner.” Claim 13 is supported by the specification as a whole, but especially by Figures 8-13 with accompanying text as well as page 12, lines 17-26.

Claim 14 depends from Claim 12 and further limits Claim 12 by requiring that “the body liner, the tangential inlet liner, and the tangential outlet liner are made of ceramic.” Claim 13 is supported by the specification as a whole, but especially by page 9, 7-17.

28. A piping elbow comprising:

two substantially-identical components (800), each component including:

a substantially cylindrical body section (804) having a first end and an open second end, the body section containing a removable liner (808); and

a tangential inlet/outlet (802) attached to the body section near the first end, the tangential inlet/outlet containing a removable liner (806),
wherein the second ends of the two components are removably attached to each other.

Claim 28, on the other hand, is drawn to a preferred embodiment of a piping elbow, comprising two substantially-identical components including 1) a substantially cylindrical body section containing a removable liner and 2) a tangential inlet/outlet containing a removable liner. The primary difference between Claim 12 and Claim 28 is that the piping elbow of Claim 28 comprises two substantially-identical components. Claim 28 is supported by the specification as a whole, but especially by Figures 5-11; page 1, line 23 to page 2, line 22; page 4, lines 12-19; page 7, lines 18-21; page 9, lines 7-29; page 10, lines 1-22; and page 12, lines 3-26.

Claim 29 depends from Claim 28 and further limits Claim 28 by requiring that “each of the removable liners is ceramic.” Claim 29 is supported by the specification as a whole, but especially by page 9, 7-17.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

- I. The Examiner has rejected Claims 12-14 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,301,651 issued to Cocchiara et al (“Cocchiara”) in view of U.S. Patent No. 2,226,494 issued to Jacocks (“Jacocks”) and further in view of U.S. Patent No. 4,554,721 issued to Carty et al. (“Carty”).

- II. The Examiner has rejected Claims 28 and 29 under 35 U.S.C. 103(a) as being unpatentable over Cocchiara in view of Carty and further in view of U.S. Patent No. 255,427 issued to Forman (“Forman”).

7. ARGUMENT

I. Claims 12-14 are patentable over Cocchiara in view of Jacocks and Carty.

The combination of Cocchiara, Jacocks, and Carty as viewed by one of ordinary skill in the art at the time of the present invention does not render the present invention obvious. Applicants agree with the Examiner's determination that "Cocchiara et al fails to teach that the liners for the body, inlet and outlet are removable." Current Office Action, p. 4. Moreover, there is not even a teaching or suggestion of a need for removable liners. The liners in Cocchiara are used to create air gaps 39 that provide insulation means. There is no teaching or suggestion in Cocchiara that the exhaust gas passing through the reactor is abrasive and no teaching or suggestion that the liner may ever need to be removed to replace the liner or inspect the inside of the reactor. The liner in Cocchiara appears to be a permanent liner that is not subjected to an abrasive environment and is not designed or intended to ever be removed. Thus, Cocchiara provides no motivation to make the liner in Cocchiara removable.

The Examiner does point out that Cocchiara states the "linings 40, 41, and 42 are formed of thin stainless steel plate attached by crimping or expansion into engaging contact with the reactor wall (or by any other suitable method)." Applicants assert that a parenthetical stating that Cocchiara's linings may be attached by any suitable method is not an enabling disclosure of any specific method of attaching linings. In light of the fact that Cocchiara provides no motivation for removable liners, this parenthetical is especially not an enabling disclosure of a specific method for creating a liner joint comprising a removable body liner and a removable inlet/outlet.

The Examiner cites Carty, for the purpose of asserting that Carty teaches that it "is known to provide an elbow with a replaceable ceramic liner (column 4, lines 27-32, column 2, lines 50-55) for wear resistance of the fluids on the elbow body." The Examiner asserts that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to replace Cocchiara et al's stainless steel liners with removable ceramic liners in order to easily replace worn liners and to reduce cost and weight." Current Office Action, p. 4. Applicants respectfully disagree.

Carty teaches a single continuous piece of ceramic liner that is removable. However, Carty does not address liner joints at all. Thus, Carty does not teach or suggest how the

removable liner in Carty could be used as a removable inlet/outlet liner in conjunction with a removable body liner in a piping elbow having a tangential inlet, a tangential outlet, and a substantially cylindrical body. Similarly, Carty does not teach or suggest how the removable liner in Carty could be used as a removable body liner in conjunction with a removable inlet/outlet liner in a piping elbow having a tangential inlet, a tangential outlet, and a substantially cylindrical body. Even if Carty is properly combinable with Cocchiara, which is doubtful, the combination does not teach or suggest how the liner in Carty can be used as one of the liners required by the present Claim 12. For example, there is no teaching or suggestion, let alone an enabling disclosure, in the combination of how to shape a liner for a tangential inlet/outlet and a liner for an elbow body so that the two can form a liner joint wherein both the inlet/outlet liner and the body liner are removable.

As explained in the present specification, on the other hand, liners of the present invention “provide a joint design that aligns and holds the parts of the liner in place with respect to one another, requiring little or no grouting or bonding to maintain the integrity of the joint. That is, once a body liner is inserted into the body of a piping elbow in keeping with Figures 8-13, for example, the insertion of a tangential inlet liner and a tangential outlet liner into the cavity of the body liner holds the body liner in place with little or no bonding. Similarly, if the tangential inlet liner and tangential outlet liner are removed, the body liner can be removed for inspection or replacement. In this manner, the tangential inlet liner and the tangential outlet liner are removably inserted into the cavity of the body liner and the body liner is removably inserted into the body of a piping elbow.” Specification, p. 12, lines 17-26.

Accordingly, the Examiner is combining a reference that does not teach or suggest removable liner or even a need or a benefit of having removable liners with a reference that does not involve liner joints at all and claiming that the combination makes obvious to one of ordinary skill in the art Claims 12-14, which require a removable body liner, a removable inlet liner, and a removable outlet liner. Applicants disagree, and respectfully request this rejection be withdrawn.

Jacocks is recited by the Examiner for the purpose of teaching that the ends of a vessel can be removable. Jacocks is not pertinent to the above arguments and, therefore, is not discussed here in more detail with relation to the above argument.

Claim 13 of the present invention further limits the claimed piping elbow of Claim 12 by requiring that “the tangential inlet liner and the tangential outlet liner are each inserted into a

cavity in the body liner.” Claim 13. The Examiner apparently gives this limitation no patentable weight. With respect to Claim 13, the Examiner states that “the method of forming the device is not germane to the issue of patentability of the device itself. A product must structurally distinguish from the prior art. Cocchiara et al meets the claim insofar as the tangential inlet liner and the tangential outlet liner are disposed in a cavity in the body liner. As shown in FIG. 13 and described in col. 8, ll. 49-53, inlet and outlet liners 42 extend into body liner 40 (note the darkened line representing liner 42 that extends into body liner 40).”

Applicants assert that Claim 13 adds a structural limitation to Claim 12 and does not merely describe a method of forming. In the present specification, Applicants state on page 12, lines 20-22 that “the insertion of a tangential inlet liner and a tangential outlet liner into the cavity of the body liner holds the body liner in place with little or no bonding.” It makes little sense to argue that the act of inserting the inlet liner and the outlet liner in a cavity of the body liner (i.e., method of forming) is what holds the body liner in place. A more appropriate interpretation of the claim language would be that the state of having the inlet liner and outlet liner inserted into a cavity in the body liner is what holds the body liner in place. The state of having the inlet liner and the outlet liner inserted into a cavity in the body liner is a structural limitation. In fact, the state of being “inserted into” is frequently used in patent claims to provide structural limitation. For example, see Claim 2 of U.S. Patent No. 7,195,288 issued March 27, 2007 by the present Examiner.

I. Claims 28 and 29 are patentable over Cocchiara in view of Carty and Forman.

Claims 28 and 29 are patentable over Cocchiara in view of Carty for the same reasons stated above. Additionally, combining Forman with Cocchiara and Carty, even if the combination is proper, does not render the present invention unpatentable.

A. Forman is not properly combinable with Cocchiara and Carty.

One of ordinary skill in the art seeking to provide a liner to a piping elbow to protect the elbow from a corrosive and/or abrasive fluid would not look to Forman for guidance. Forman teaches attaching two components using a bolt that passes through the interior of the piping elbow. Thus, the bolt in Forman would be exposed to the corrosive/abrasive fluid and would itself need to be protected from the fluid passing through the piping elbow. There is no

indication in Forman of any need for a liner, let alone any teaching or suggestion of how removable liners can be used in conjunction with the elbow so as to protect the inlet, outlet, body, and bolt.

- B. Even if Forman is properly combinable with Cocchiara and Carty, the combination does not render Claims 28 and 29 obvious to one of ordinary skill in the art.

Claims 28 and 29 require the piping elbow to comprise two substantially-identical components. Expressions such as "substantially" are used in patent documents when warranted by the nature of the invention, in order to accommodate the minor variations that may be appropriate to secure the invention. *Verve, LLC v. Crane Cams, Inc.* 311 F.3d 1116, 65 USPQ2d 1051 (Fed. Cir. 2002). Such usage may well satisfy the charge to "particularly point out and distinctly claim" the invention, 35 U.S.C. § 112, and indeed may be necessary in order to provide the inventor with the benefit of his invention. *Id.* In *Andrew Corp. v. Gabriel Elecs. Inc.*, 847 F.2d 819, 821-22, 6 USPQ2d 2010, 2013 (Fed. Cir. 1988) the court explained that usages such as "substantially equal" and "closely approximate" may serve to describe the invention with precision appropriate to the technology and without intruding on the prior art. *Id.* The court again explained in *Ecolab Inc. v. Envirochem, Inc.*, 264 F.3d 1358, 1367, 60 USPQ2d 1173, 1179 (Fed. Cir. 2001) that "like the term 'about,' the term 'substantially' is a descriptive term commonly used in patent claims to 'avoid a strict numerical boundary to the specified parameter,'" quoting *Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 1217, 36 USPQ2d 1225, 1229 (Fed. Cir. 1995). *Id.* It is well established that when the term "substantially" serves reasonably to describe the subject matter so that its scope would be understood by persons in the field of the invention, and to distinguish the claimed subject matter from the prior art, it is not indefinite. *Id.*

Applicants assert that shell A and shell B in Forman are not two substantially-identical components as required by Claims 28 and 29. The two substantially-identical components are made substantially-identical for simplicity and ease of manufacture and they can be removably attached in a reverse mirror-image relationship. Specification at page 8, lines 11-13. Another advantage of having two substantially-identical components is that two of the same component (e.g., 800) can be removably attached to each other to form the piping elbow. Specification at page 10, lines 20-22. In this manner, the two substantially-identical components are

interchangeable. Either component can be used as the top component and, similarly, either component can be used as the bottom component.

Shell A and shell B in Forman have differences that prevent them from being removably attached in a reverse mirror-image relationship and prevent them from being used interchangeably. Shell A has a whole in the shell through which the bolt G must pass. Shell A also includes a socket or depression I into which a washer of lead, rubber, or other similar material is fitted. Shell B, on the other hand, includes a downward projection J having a screw-thread to receive the end K of the bolt G on the inside. Additionally, shell A is provided with a flanged rim E. Shell B, on the other hand, is provided with an edge F to fit into the flanged rim E of Shell A. Clearly, shell A and shell B of Forman must be manufactured as different components. It is also clear, that shell A and shell B can not be used interchangeably. That is, the piping elbow in Forman can not be formed by joining two shell A components or by joining two shell B components.

Applicants assert that Forman, even if combined with Cocchiara and Carty, does not make obvious two substantially-identical components as required by Claims 28 and 29. Accordingly, Applicants respectfully request that this rejection be withdrawn.

8. SUMMARY

Applicants respectfully submit that the claims are in condition for allowance and notification to that effect is earnestly requested. Applicant hereby petitions for any extension of time which is required to maintain the pendency of this case. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 50-3735.

If the enclosed papers or fees are considered incomplete, the Mail Room and/or the Application Branch is respectfully requested to contact the undersigned collect at (508) 616-9660, in Westborough, Massachusetts.

Respectfully submitted,

Date: July 24, 2007

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APPENDIX I

The Claims Appendix

12. A piping elbow, comprising:
 - a substantially cylindrical body having a first end and a second end, wherein at least one of the ends is removably attached, and wherein the body contains a removable liner;
 - a tangential inlet attached to the body near the first end having a diameter smaller than the diameter of the body, wherein the tangential inlet contains a removable liner; and
 - a tangential outlet attached to the body near the second end having a diameter smaller than the diameter of the body, wherein the tangential outlet contains a removable liner.
13. A piping elbow according to Claim 12, wherein the tangential inlet liner and the tangential outlet liner are each inserted into a cavity in the body liner.
14. A piping elbow according to Claim 12, wherein the body liner, the tangential inlet liner, and the tangential outlet liner are made of ceramic.
28. A piping elbow comprising:
 - two substantially-identical components, each component including:
 - a substantially cylindrical body section having a first end and an open second end, the body section containing a removable liner; and
 - a tangential inlet/outlet attached to the body section near the first end, the tangential inlet/outlet containing a removable liner,
 - wherein the second ends of the two components are removably attached to each other.
29. A piping elbow according to Claim 28, wherein each of the removable liners is ceramic.

APPENDIX II

Evidence Appendix

There is no pertinent evidence to be cited in this Appendix.

APPENDIX III

Related Proceedings Appendix

There are no known other prior or pending appeals, interferences, or judicial proceedings which may be related to, directly affect, be directly affected by, or have a bearing on the Board's decision in the pending Appeal.